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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,292	08/22/2003	Oksana Penezina	57315 (45858)	9380

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EXAMINER	
VO, HAI	

ART UNIT	PAPER NUMBER
1794	

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06/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/646,292	PENEZINA ET AL.	
	Examiner	Art Unit	
	Hai Vo	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-22,48 and 50-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-22,48 and 50-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The art rejections based on Callahan have been withdrawn in view of the present amendment. Callahan does not teach or suggest the surface-modifying molecules that are crosslinked to form a crosslinked hydrophilic polymeric network at the substrate surface and inner surfaces of the pores. However, the art rejections based on Witham are maintained.

Claim Objections

2. Claims 1-3, 5-22, 48, and 50-60 are objected to because of the following informalities: 10,000 *daltons* should be in a plural form. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-3, 5-22, 48, and 50-60 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Paragraph 17 of the US Patent Publication 2004/0242714 discloses the membranes having molecular weight cut off values of 10kDa or less. This is completely irrelevant to the difunctional acrylate monomer with a molecular

weight less than 10 kDa. Thus the amendment is not fully supported by the description presented in the original disclosure.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 5-9, 12-17, 19, 21, 22, 48, and 58-60 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Witham et al. (US 6,193,077). Witham teaches a composite porous membrane comprising a hydrophobic substrate coated with difunctional surface-modifying molecules. The hydrophobic substrate is polyethersulfone membrane having a pore size of 0.1 to 20 μm (column 4, lines 28-30). The difunctional surface-modifying molecule comprises ethoxylated bisphenol A diacrylate which is present in an amount of 0.1 to 0.7 wt% (column 4, lines 50-52, column 5, lines 26-30). Witham discloses polymerization of the polyfuncitonal monomers

causing the corresponding polymer to attach to the polyethersulfone membrane and the polyethylene oxide to form a non-extractable surface (abstract). Likewise, the polymerization of the polyfunctional monomers forms a crosslinked hydrophilic polymeric network consisting of the difunctional surface-modifying molecules at the surface of membrane. There is no pore plugging upon coating and curing (column 4, lines 5-8). Likewise, the pore sizes of the coated composite porous membrane are substantially the same as the pore size of the composite porous membrane before coating. The flow rate through the pores of the coated membrane is substantially the same as the flow rate through the pores of the non-coated membrane (table 1). Since Witham was using the same material for the difunctional surface modifying molecule as Applicants, it is the examiner's position that the preferential association, wetting characteristics would be inherently present. Witham discloses that the membrane is autoclavable (column 4, lines 10-15). Rosenberry et al. (US 5,719,227) is relied on as evidence to show a state of fact – that is, ethoxylated bisphenol A diacrylate which is commercially available has a molecular weight of about 776 (column 7, lines 17-19). Further, Soane et al. (US 2004/0197562) is relied on as evidence to show a state of fact – that is, ethoxylated bisphenol A diacrylate which is commercially available has a molecular weight of about 424 (paragraph 95). Accordingly, Witham anticipates or strongly suggests the claimed subject matter.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witham et al. (US 6,193,077) as applied to claim 1 above, and further in view of Steuck et al. (US 4,618,533). Witham does not specifically disclose the microporous substrate being polyvinylidene fluoride. Steuck, however, teaches a porous membrane for use in filtration comprising a porous membrane including polyether sullfone and polyvinylidene fluoride (column 2, lines 60-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute polyvinylidene fluoride for the polyethersulfone of the Witham invention since two polymers have been shown in the art to be recognized equivalent porous membranes in filtration processes.
8. Claims 18, and 50-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witham et al. (US 6,193,077) as applied to claim 1 above, and further in view of Hu et al. (US 5,209,849). Witham does not specifically disclose the use of a photoinitiator to achieve polymerization of the monomers over the entire surface of the membrane. Hu, however, discloses the use of DROCUR ® 1173 as a photoinitiator to achieve polymerization of the monomers over the entire surface of the membrane. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use UV treatment to achieve polymerization of the monomers over the entire surface of the membrane because UV treatment and plasma treatment have been shown in the art to be recognized equivalent treatments to impart hydrophilicity to a hydrophobic porous membrane.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witham et al. (US 6,193,077) as applied to claim 1 above, and further in view of Wu et al. (WO 00/50161). US 6,780,327 will be relied on as an equivalent form of WO 00/50161 for convenience. Witham does not specifically disclose the crosslinked coating having been modified with a positive charge. Wu, however, teaches a porous membrane for use in filtration comprising a porous membrane and a crosslinked acrylic coating having a pendant cationic group linked to the backbone of the coating (column 4, lines 1-5, 30-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a coated membrane comprising a cross-linked coating that has fixed negative charges motivated by the desire to provide the coated membrane suitable for filtration of fluids containing negatively charged materials.
10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witham et al. (US 6,193,077) as applied to claim 1 above, and further in view of WO 00/50160. Hou et al. (US 6,783,937) will be relied on as an equivalent form of WO 00/50160. Witham does not specifically disclose the cross-linked coating having been modified with a negative charge. Hou, however, teaches a porous membrane for use in filtration comprising a porous membrane and a cross-linked acrylic coating having fixed negative charge (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a coated membrane comprising a cross-linked coating that has fixed

negative charges motivated by the desire to provide the coated membrane suitable for filtration of fluids containing positively charged materials.

11. The art rejections over Witham taken individually or in combination with several references have been maintained for the following reasons. Applicants contend that Witham fails to teach or suggest the difunctional acrylate monomer with molecular weight less than 10,000 Daltons. The examiner respectfully disagrees. The examiner invites Applicants' attention to Rosenberry et al. (US 5,719,227) and Soane et al. (US 2004/0197562) which are relied on as evidence to show a state of fact – that is, ethoxylated bisphenol A diacrylate which is commercially available has a molecular weight of about 776 and 424 respectively. The examiner notes that Witham requires a PEO with a molecular weight ranging from 25,000 to 1,000,000 daltons. However, the claim does not exclude a coating solution that includes a high molecular weight PEO. It is suggested that incorporation of the reagent solution consisting of a difunctional acrylate monomer, a photoinitiator and a solvent into the claim would be sufficient to remove Witham as prior art.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hai Vo/
Primary Examiner, Art Unit 1794